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HEAVY LOSSES DUE TO INFESTATION OF STORED GRAIN CAN BE AVOIDED

By using chemical insecticides and proper sanitation measures, millions of bushels of grain which normally become infested during storage can be kept at top quality.

Infested grain originally intended for human consumption often must be sold -- at a lower price -- as feed for livestock. Some may contain so many dead insects and insect fragments that even its sale for feed is forbidden.

Farmers, millers, and all sections of the industry lose millions of dollars a year in this way. In the extremely bad year of 1947, the loss was estimated at $600,000,000. Although the damage has been less in subsequent years, it still constitutes a heavy loss.

Today, with the availability of the new organic residual insecticides, it is possible to reduce these losses by spraying the floors and walls of empty bins in which the grain is to be stored. The cost is relatively small. It is estimated that an investment in spraying floors and walls costing less than a bushel of wheat might well save thousands of bushels of grain.

Methoxychlor Recommended for its Safety

The agricultural chemicals industry is cooperating with the Food and Drug Administration, the Fish and Wildlife Service, and the United States Department of Agriculture in a program to promote proper preparation of the storage bins before the crops are harvested.

Spraying of the bins is the initial step in this program. United States Department of Agriculture officials, after extensive tests, have expressed their belief that, when correctly used, "residual insecticides can do much to maintain

stored grain at top quality and save millions of bushels that are annually destroyed by insect pests."

Since the stored grain might pick up some of the residual insecticide from the floor and walls, farmers and elevator operators have been urged to be careful in their choice of materials.

Materials such as "Marlate" 50 insecticide or "Marlate" 2-MR methoxychlor emulsifiable composition are the only ones of the new type chlorinated hydrocarbons which are recommended without restriction. This is because, besides being effective, they are of a low order of toxic hazard at use levels.

DDT sprays have been recommended provided they are used with caution and applied only at recommended dosages. While available evidence does not indicate that the use of DDT in grain bins is a health hazard, it has not been determined to what extent residues may rub off the wall and be held in the grain.

Sprays of another group -- pyrethrum and allethrin -- are also considered safe to use. Their cost, however, is much higher than that of the hydrocarbon materials.

Insects Which Normally Inhabit Bins

Methoxychlor has been recommended by the Department of Agriculture for the control of such bin inhabiting insects as cadelle, flat grain beetle, saw-toothed grain beetle, lesser grain borer, red flour beetle, long-headed flour beetle, confused flour beetle, rice weevil, granary weevil, foreign grain beetle, and hairy fungus beetle.

Its recommendation is that methoxychlor sprays at 2.5% concentration, at the rate of two gallons of water per 1,000 square feet of wall or floor surface, be used. For practical purposes, this is the equivalent of 2 lbs. of "Marlate" 50 insecticide or two quarts of "Marlate" 2-MR methoxychlor emulsifiable composition to five gallons of water.

With proper precautions, a 2.5% concentration of DDT is also recommended, while pyrethrum and allethrin may be used at 0.5% concentrations.

Infestations Generally Found in Wooden Walls or Floors

In some sections of the country, wheat may be infested in the field before it is stored. Fumigation will control the field infestation, and bin sprays will control the infestations of bin origin. The two measures therefore are not competitive, but complementary.

Many of the insects infesting whole grain are wood inhabitants -- i.e., they shelter in burrows in the wall or small crevices or cracks in the floor or wall, and use the wooden structure as a base for their entry into the grain. They are present in granaries most of the time, unless the bins are thoroughly cleaned out and sprayed. With "Marlate" insecticide sprayed on the walls, however, a barrier is erected, which must be crossed before getting to the grain. In trying

to do so, the insect is poisoned. Therein lies the importance of the bin spray. How this fits in with an overall program is shown in the accompanying box.

Use of insecticides is important in maintaining top quality grain in storage. Spraying, however, is not a clean-up program in itself. In order to get good results, Du Pont entomologists recommend an overall control program, as follows:

1. Bins should be rat and mouse-proof.
2. Birds should not have access to bins.
3. Bins should be cleaned after emptying, especially all cracks.
4. Accumulations of waste grains or mill cereal products from underneath the bins, the driveways between bins, and from nearby buildings should be removed.
5. Walls and floors of bins should be sprayed with methoxychlor.
6. Store dry grain only (12% moisture or lower).
7. Inspect at least once a month, and fumigate as required.

INDUSTRY USING LABORATORIES IN ATTACK ON WATER, AIR POLLUTION

Industry is making greater progress in combatting air and water pollution by attacking the problem through its laboratories than can ever be accomplished by "legislation or regulation," Henry B. du Pont, a vice president of the Du Pont Company said recently at Pasadena, Calif. He spoke at a National Air Pollution Symposium.

"As Americans have found in every field," he said, "it is invention and development, not legislation or regulation, that has proved our most reliable instrument of progress."

While conceding that pollution-control laws "are working satisfactorily where they have been well administered," Mr. du Pont said that laws "cannot bring clean air and water any more than safety regulations alone can prohibit accidents."

Conceivably, he said, laws could be drawn "ordering our air and our streams to be pure as those of the forest primeval," but the only way to make them operative would be "for all industry to shut down and for all the people to move away."

Practical Abatement Is Possible

"The peasant villages of central Europe are, perhaps, free of smog, just as they are free of bathtubs, Chevrolets, and electric refrigerators," Mr. du Pont said. "They are not as free of odors as some might expect, and they are certainly not free of disease, dirt and poverty.

"So, in a way we have paid a penalty for the kind of civilization we have built. But we do not agree that it is a permanent price we have to pay. We know that with the will to correct the situation and with proper effort and sufficient time pollution can, for all practical purposes, be eliminated.

"We cannot, of course, expect that the air of Pike's Peak can ever be transplanted to down-town New York. Practical abatement, however, is well within reach of most industries."

While not pretending to speak for industry generally, Mr. du Pont stated that the Du Pont Company considers pollution abatement "as one of its first responsibilities."

Large Investment in Pollution Abatement

"On new plant construction, our top management policy is to insist, before approval of the project is given, that all pollution problems be solved in advance." The Du Pont Company, he said, now has, in investment or authorized expenditure, nearly $25,000,000 represented in pollution abatement facilities.

PROGRESS OF AGRICULTURE AND DU PONT NOTED IN 150TH BIRTHDAY CELEBRATION

The Du Pont Company, now celebrating its 150th anniversary, has been associated with the improvement of agriculture in the United States since its earliest days.

The founder, Eleuthere Irenee du Pont de Nemours, took up residence on the Brandywine on July 19, 1802, to start in the black powder business. The struggling Republic --- then comprised of 16 states, with a population of 5,300,000 --- lacked good powder for hunting, land clearance, mining, quarrying, and self-protection. It was President Thomas Jefferson who urged the young French refugee to build an American mill to make gunpowder equal to that imported from Europe. E. I. du Pont had learned how to make black powder under the renowned French chemist Lavoisier.

Du Ponts Always Interested in Agriculture

In France, the du Pont family had always been interested in agriculture -- including sheep raising -- and they brought this interest with them to the New World. In fact, one of the original projects the family had when it first came to America in 1800 was to establish colonies in the Shenandoah valley of Virginia. When this and other schemes were abandoned, it was decided to concentrate on the gunpowder business. Eleuthere therefore went back to France to raise capital and buy machinery. Among the things he brought back to America in 1801 were seeds and plants and seven young Spanish merino sheep.

One of the two huge millstones which the founder ordered in France at that time has been converted into a marker commemorating the founding of the company. The stone weighs about seven tons, and its function, by the application of water power, was to grind the ingredients of black powder -- sulfur, charcoal, and saltpeter. Bronze plaques designed and executed by Domenico Mortellito, Wilmington sculptor, have been mounted on the stone, which in turn rests upon a granite base.

The United States in 1802 was an agricultural country, mostly along the Atlantic seaboard. As the frontier was pushed westward, Du Pont powder played an important role in clearing land for farming, and even today Du Pont dynamite is used for clearing ditches in many rural communities.

The story of Du Pont's growth has been told in a book, "Du Pont -- The Autobiography of an American Enterprise." This is a 144-page volume, with 20 pages in color. Its theme is the parallel development of the company and the nation. It relates the company's activities and operations to broad social and economic developments in the United States.

A limited supply of the anniversary book has been set aside for distribution to readers of the Agricultural News Letter who are interested in it. While they last, the books may be obtained by writing to the Editor.

New Relationship Between Agriculture and Industry

The transformation of the United States from a country in which 90 per cent of the people made their living by farming into an industrial giant which is also the leading agricultural nation, is described in pictures and text. The book recalls that forests "gave way to land-hungry settlers who left what they considered 'the overcrowded east' to build their homes in the wilderness. These pioneers used Du Pont powder to clear farms, hunt game." Later, explosives were used in large quantities for blasting ditches for drainage and irrigation work; to blast postholes, sink wells, and open up underground streams by blasting.

American inventive genius was also at work, and before long the cotton gin, the reaper, and the steel plow had effected a virtual revolution in agricultural methods. In 1830, the Du Pont book points out, the "human labor factor needed to produce one bushel of grain was three-and-a-half hours. Sixty years later, it was but 10 minutes."

It continued: "A new relationship, based on invention was developing between industry and agriculture. On the vast prairies, a few men with ingenious new machinery could raise wheat by the hundreds of thousands of bushels. The refrigerator gave cattlemen markets a thousand miles away. Barbed wire, confining cattle on the treeless plains, cheered ranchers....."

Agricultural Chemicals Enter the Picture

Mass production of automobiles, and then of tractors and other new farm machines, played their part in increasing the productive capacity of each person on the farm, and each acre of land.

The last two generations of farmers have also been greatly aided by the development of agricultural chemicals, a field Du Pont entered in the 20's. Du Pont was a pioneer in the field of seed treatment in the United States, right after World War I. Soon it started using nitrogen from the air in making synthetic ammonia, which in turn is used in making compounds for fertilizers and feeds for ruminants.

"Insecticides," the Du Pont book points out, "represented an entirely new field of Du Pont endeavor, sparked by the purchase of the Grasselli Chemical Company, in 1928." Now a department of the Du Pont Company, it had long been a manufacturer of insecticides, fungicides, and other agricultural chemicals.

Research Intensified During Depression

When the depression struck the country in 1929, Du Pont was hit along with all other industries. But it took a bold course: "Du Pont management, looking at the long term, felt that normal times would come back only if industry continued its research, opened new plants, and went on developing new products, thus creating new jobs and opportunities."

Within recent years, about half of Du Pont's sales have been in products that were unknown or in their commercial infancy only 20 years previously and among these are many chemicals used in agriculture. These are the fruits of research, which, as the anniversary book says, "is the company's lifeblood -- the road to progress in the highly competitive chemical industry."

Relations With Farmers on Reciprocal Basis

Today, American farmers use a variety of Du Pont products -- paints, wood preservatives, plastic-coated wire mesh for chicken houses, fertilizer ingredients, feed compounds, insecticides, fungicides, weed killers, seed-treating chemicals, agricultural explosives, formaldehyde, Vitamin D for chickens, as well as veterinary products.

Huge quantities of forest and farm products are also used by Du Pont every year as raw materials for its plants, such as cotton, wood pulp, corn products, turpentine and pine rosin, and vegetable oils.

Since 1802, Du Pont has grown from one small mill, helping fill the needs of the young nation for blasting and gunpowder, into a manufacturing concern with 71 plants located in 25 states of the Union. It employs 87,000 men and women, is owned by 140,000 stockholders. It buys from more than 30,000 suppliers and sells to more than 75,000 customers. Many farmers are in each of these classes and some in both.

Today, Du Pont laboratories are searching for new ways in which farm products may be used in manufacturing, and is continuing its research for greater service in the field of agriculture, animal medicine and nutrition.

SANITATION MUST ACCOMPANY USE OF CHEMICALS TO CONTROL FLIES

Irritating, annoying, and disease-carrying flies can be controlled, but chemicals cannot do the job alone, according to Harold Gunderson, entomologist of Iowa State College at Ames, Iowa. He stressed that sanitation must go hand in hand with the use of chemicals.

Dr. Gunderson's views are supported by the experiences in 63 Iowa counties and of more than 85,000 farmers in Iowa who carried out active campaigns against the pests in 1951. They kept flies under control in their towns and on their farms by waging a two-front war. They cleaned up and kept the areas free of fly-breeding places, and they used chemical insecticides when and where they would do the most good.

Start With Sanitation

Sanitation is the starting place for any effective fly control program, Dr. Gunderson said. Flies pick out the garbage cans and trash heaps in towns and the manure piles on farms for the homes of their offspring. Cleaning up these breeding places must be strongly emphasized in the control campaign. Dr. Gunderson recommends that farmers should clean up piles of rotting leaves, weeds or other decaying organic matter. Flies like these spots too, he said.

Second Step Is Spraying

Sanitation helps keep the fly populations down by reducing the number of places for the adults to lay eggs and the young to grow up. But sanitation won't actually kill many of the flies, according to Dr. Gunderson. That's why the effective campaign includes a second step -- use of chemical insecticides.

Dr. Gunderson urges farmers who are investing time and money in fly control to avoid the mistake many folks have made -- that of figuring that chemicals will do the whole job. He emphasized that you can't expect any chemical to control flies if you ignore sanitation.

Time after time, Dr. Gunderson pointed out, these folks have only had to look around their farms and homes to see the failure of chemicals where sanitation wasn't practiced. To be sure, they killed flies with the chemicals, but they couldn't kill them as fast as the flies reproduced in the made-to-order breeding places that should have been eliminated by a clean-up drive, he said.

CHEMISTRY PROVIDES NEW AIDS FOR HOME GARDENER

By D. E. ROSEN
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It would be interesting to know how many home gardeners have tried for one or two years to raise a crop in their back yards, then given up. The bugs and the blights, they'll tell you, got more fresh vegetables than the family did!

Whether it be a vegetable garden, a small home orchard, or the flowers and shrubs in the yard -- there will always be bugs to battle and plant diseases to conquer.

As in every other case where Nature has challenged mankind, we've learned to control these garden destroyers. Cultural practices such as cleaning up all garden trash in the fall, keeping fencerows free of weeds, or starting certain plants in cold frames are examples of man's ingenuity in outwitting garden pests. But no cultural approach has yet been devised to eliminate garden threats, so through chemical research, dusts and sprays have been developed to kill insects or protect plants against diseases.

How to Recognize Principal Bugs

To successfully combat insects and diseases, it is helpful to recognize the principal bugs the gardener is most likely to run into. They are:

MEXICAN BEAN BEETLES -- They closely resemble ladybugs, but are somewhat larger and usually a bit darker orange, with eight black spots on their backs. Entomologists say they originally came from Mexico, first arriving in Alabama in a shipment of alfalfa hay in 1920. Now, they're found throughout the United States. They spend their winters in leaves and rubbish. They're on hand when bean plants first push through the ground and start feeding as soon as there is enough leaf surface to provide a meal. Early in the season, eggs are laid, from which spiny white larvae hatch. From egg to adult takes about a month, so two or more generations are produced in a summer. Beans should be sprayed or dusted with an insecticide as soon as the plants are well out of the ground. Steer clear of highly toxic materials, for you may have to keep the treatments up until almost picking time.

CORN EAR WORM -- A rather pretty moth which emerges from the ground in the spring is actually responsible for these ugly pests. It flies mostly at dusk, feeds on flower pollen, and lays eggs in fresh corn silk. In two to ten days the worm hatches, bores into the silk, and eats the tip of the ear down to the cob. Some folks tie paper bags over the ears. Others insert mineral oil (often fortified with an insecticide) into the silk. These methods are not entirely effective.

The more modern approach is to use a recommended insecticide, spraying or dusting the silk every three to four days until the silks are brown and dry.

This same pest is known as the tomato fruit worm when it attacks the tomato fruit.

CABBAGE WORMS -- There is a whole family of these worms that eat holes in the outer leaves of cabbage, cauliflower, broccoli, lettuce, spinach, beets, peas, celery, parsley, potatoes, and nasturtiums, carnations, and mignonette. Most frequently seen is the cabbage looper, so named because he humps his back "amidships" when either resting or in motion. Winters are spent in cocoons attached to leaves. In the spring a grayish-brown moth emerges, flying at night and laying individual eggs on the leaves. These hatch into worms. Four or five generations may develop in a single summer.

Applications of insecticides recommended to kill these worms should start early in the spring, when larvae are small and most easily poisoned. Treatments should be repeated weekly.

FLEA BEETLES -- A number of varieties of this tiny beetle are charged with spreading plant diseases, as well as with riddling the leaves of plants with tiny holes. The potato flea beetle spreads bacterial wilt of corn. They spend their winters in trash along ditch banks, fencerows and other sheltered places, going to work on weeds and trees until spring garden crops are ready. Young tomato plants and other transplanted crops are favorite foods.

In the old days when rather poisonous arsenical sprays were used, it was impossible to successfully control flea beetles, for arsenic was so distasteful the insects would not eat enough to kill them. The new residual insecticides that kill by contact, however, have solved that problem.

CUCUMBER BEETLES -- They are either striped or spotted, depending on species. Winters are spent as adults in the crowns of grass or weeds the frosts do not kill. When days get to 70 degrees, they begin flying and laying eggs around roots of plants and underground parts of stems. On hatching, the larvae bore into these roots and stems and start feeding. By July they have reached the adult stage, when they mate to produce a second generation, meantime chewing holes in the plant leaves during the mating season. While cucumbers, squash and melons are favorite hosts, these pests also get into flower beds. Insecticide applications should start as soon as these plants break through the ground, to prevent initial egg laying. During the summer, foliage should be treated to prevent feeding by the adults. Be sure to select a material that is both safe to the plants and toxic to the beetles.

APHIDS or Plant Lice -- There are many species of these tiny pests. They come in all colors but the ones we usually see on roses, or in the vegetable garden, are green or black. They cluster together, puncture plant tissues with their beaks and suck out plant juices. Results are seen in stunted growth, deformed buds or shoots, and galls on stems. Aphids also spread plant diseases and produce a sweet substance called "honeydew" which attracts ants and is a favored

culture for the growth of sooty mold. Many of the insecticides which effectively control larger insects will not handle aphids.

JAPANESE BEETLES -- They came from Japan on imported trees and were first seen around Riverton, N. J., in 1916. They now cover quite a large portion of the Northeast and are found in certain spots around the Midwest and South. These bronze beetles feed heavily on foliage of almost all trees, most flowers, but only a few vegetables. Some of the newer insecticides are quite effective in killing Japanese beetles.

PLUM CURCULIO -- Another problem on fruit trees, this snouted beetle cuts crescent-shaped slices in young fruit as repositories for its eggs. When the eggs hatch, the grubs begin to eat the fruit, burrowing to the center. Despite his name, it is as fond of peaches, cherries, and apples as it is of plums. Keeping the ground clean to deprive beetles of places for winter hibernation will help control them. In addition, a recommended spray should be applied three times (about ten days between applications) starting shortly after spring petals fall, when the young fruit is forming.

SCALE INSECTS -- These tiny, sucking insects infest the bark covering of trees, shrubs and even lilac bushes. They are active for only a short time after hatching, then lose their legs, stick their beak in the plant and stay there the rest of their lives. Some have a hard, protective armor, others a soft coat. You control them with sprays of oil before new spring growth starts, and sometimes with a summer oil spray when the young ones are crawling.

Plant Diseases Also Dangerous

PLANT DISEASES -- Often not as noticeable as insects are common plant diseases such as blights of tomatoes, black spot of roses, apple scab, and leaf spots and rusts which appear on many flowers.

In many ways these disease organisms are more dangerous than bugs, for you do not see them and are not conscious that anything is wrong until lesions begin to appear on leaves; foliage curls, withers and dies; tomatoes develop greenish-black, rotten-looking spots; or some other development is evident.

By that time, it is too late to fight the disease. For in most cases these diseases are caused by a tiny fungus, carried by the wind or driven by the rain. Your plants and trees and bushes must be protected against these fungi by a spray which will coat the foliage and prevent the disease organism from attaching itself. Once they have made fast to the plant structure, these fungi multiply and spread rapidly.

YOUR GARDEN CHEMICAL SUPPLY -- By this time, you may have the impression that several shelves in your tool shed or basement will be required to hold all the sprays and dusts to fight these bugs and blights.

Today, with improved, more effective chemicals for pest control, a relatively small assortment of material will do the job.

The same insecticide will control a number of these insects, when applied at the right time and in the right manner. Likewise, many of the important plant diseases may be controlled with the same modern fungicide.

Control Possible With Safe Materials

In discussing these insects and diseases, we have stressed the "safety factor," both to people and to plants. Modern agricultural chemistry has developed compounds which effectively control pests, yet are only mildly toxic to warm-blooded animals and do not cause injury to the most sensitive plants.

In the insecticide field, an example is methoxychlor -- a material which will control Mexican bean beetle, cabbage worms, corn ear worm, flea beetles, cucumber beetles, Japanese beetle, plum curculio, and a host of other serious garden pests. Yet methoxychlor displays an exceedingly low order of toxic effect on warm-blooded animals, so may be used as directed close to picking time with safety.

In the fungicide field, a whole family of compounds -- known as the "carbamates" -- possess this same set of characteristics. Some members of this family are "Fermate" fungicide, which controls black spot of roses and a number of fruit diseases, and "Parzate" and "Zerlate" fungicides, known for their control of many fungous diseases of vegetables.

To further simplify the gardeners' problems, scientists have learned that certain effective fungicides and insecticides may be combined in a single dust or spray material. This means that the gardener, by following directions and timing his applications properly, can use these combination products to cut his work in half. Instead of applying one material to fight bugs and another to protect against disease, he can do both jobs in a single spraying or dusting.

ANIMAL NUTRITION SECTIONS CONSOLIDATED

Research, technical development, and sales in the field of animal nutrition products, formerly shared by the Organic Chemicals and Grasselli Chemicals Departments of the Du Pont Company, have been consolidated in the Grasselli Chemicals Department. Grasselli has a long-standing interest in agricultural chemicals, including veterinary medicine and animal nutrition. The products affected by the transfer were "Cel-O-Glass" plastic coated wire mesh, "Delsterol" vitamin D_3, and methionine.

As part of this move, the director, Dr. James Waddell, and the staff of the Biological Laboratory at New Brunswick, N. J. will join the technical division of the Grasselli Chemicals Department at the Stine Laboratory, now nearing completion near Newark, Del.

CHEMICAL RESEARCH HELPS INCREASE PEAR PRODUCTION

By R. M. Roberts
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This is a story of how an experimental chemical application in a research greenhouse at Wilmington, Delaware, 15 years ago has led to the saving of millions of dollars for pear growers in the rich river valleys of Oregon. It is a practical example of the way industry's research program is designed to uncover newer and better answers to many problems on the farm, in the factory, and right in our own homes.

In 1944, pear growers in Oregon's Hood River Valley tried a new organic chemical in their orchard sprayers in an attempt to eliminate the disease known as pear scab, which disfigures the fruit and drops much of the luscious crop into the "cull" class.

Today, growers of Anjou pears in Hood River Valley annually market a bonus of more than 300,000 boxes of top grade fruit above their previous production, primarily because that new organic chemical and a cousin compound developed later are protecting their trees from the infectious, wind-borne spores of the scab organism.

Chemicals Were Rubber Accelerators

Meantime, these two chemicals are finding rapid acceptance to control scab and other diseases on Anjous, Bartletts and other varieties of pear in the Hood River Valley, the Rogue River Valley, and other lush pear growing areas of the Pacific Northwest.

The two chemicals involved are called "ferbam" and "ziram" -- better known to growers as "Fermate" and "Zerlate" fungicides. Their story is an interesting one, for they were first developed and used by Du Pont Company research chemists as aids for the rubber industry to accelerate the vulcanization process.

Then came the mid-thirties. Japanese beetles were staging a major invasion of eastern orchards, field crops, and gardens. A great variety of chemicals was being tested for insecticidal action against these pests and it was found that ferbam and ziram both tended to repel the beetles. While they were being used for this purpose, investigators noted that many plant diseases which attacked nearby plants did not show up on those sprayed with ferbam and ziram. The materials had a remarkable faculty for protecting growth from the attachment of fungus spores.

Pear Production Greatly Increased

Today, five specific fungicides are available to growers, all chemical cousins in that they are derived from dithiocarbamic acid. But in 1944, when

growers first used ferbam in Hood River Valley, this material was the first of these compounds to attain acceptance by commercial growers.

Dr. J. R. Kienholz, plant pathologist of the United States Department of Agriculture, and Dr. Leroy Childs, superintendent of the Hood River Experiment Station, relate the results of that first introduction in a technical bulletin on pear scab in Oregon, recently published by Oregon State College.

"Ferbam was first used commercially in the Hood River Valley to replace sulphur in pear scab control during 1944. By 1945 sulphur sprays were almost entirely replaced by ferbam for this purpose. It is interesting to follow the commercial production of Anjou pears since that time. Up to 1944 Anjou pear trees tended to bear fruit in alternate years. In fact, an old saying among orchardists was that if an Anjou tree bore two crops successively, it was sure to 'lay off' the third year. Since the adoption of ferbam or ziram in place of wettable sulphur, beginning in 1944, Anjou pear production steadily increased for six years, almost doubling the previous high yields.

Research Continues for New Chemicals

"Advancing tree age, weather conditions, and other factors may have partly contributed to this increased yield, but much of it can be attributed to the substitution of ferbam and ziram for wettable sulphur. Based on an approximate 30 per cent increase in fruit set determined from actual blossom counts, it is estimated Anjou pear tonnage was increased in the Hood River Valley on an average of about 300,000 boxes per year for the period 1944 to 1950. Savings in handling costs, storage space, improved fruit quality, and better tree vigor are other benefits derived from using ferbam in place of sulphur. "

More new insecticides, fungicides, and weed killers have been introduced during the past year than during any similar period in history. Some of these have already been tested and approved by federal and state experimental stations. Others are being subjected to exhaustive tests. The work going on in research laboratories and test plots today may be expected to uncover new compounds which will boost crops to unforeseen new highs, just as ferbam has done for Anjou pear growers in Hood River Valley.

OHIO EXPERIMENTERS CONQUER CRITICAL RASPBERRY DISEASE

Raspberry anthracnose, a plant disease which causes greater financial loss to black raspberry growers of Ohio than any other single disease or insect pest, can now be controlled through the use of a modern organic fungicide, according to Dr. H. F. Winter, plant pathologist of the Ohio Agricultural Experiment Station at Wooster.

Dr. Winter recounts experimental work in the control of the disease in the November-December, 1951 issue of "Ohio Farm and Home Research," an experiment station publication.

Raspberry and blackberry growers will find evidence of the disease in light-colored sunken spots, often surrounded by a red ring, most prominent on young canes in late spring and early summer. These spots cause a dieback of new canes, reducing the crop the following year. Severely diseased canes may not survive the winter. Some that do may leaf out in spring, then suddenly wilt and die just before harvest.

Wind Spreads Fungous Spores

The disease is spread by fungous spores, borne on the wind from diseased plants. Spring rains plaster the anthracnose fungus against the canes of berries, where they take up their insidious residence and begin to spread out.

For many years, growers have been attempting to control this disease with a single spraying of liquid lime-sulfur at the season of bud-break. Results have not been satisfactory and the disease has continued to take a heavy toll. Dr. Winter declared he could not find a single black raspberry planting in Ohio which was free of the disease.

Results of Experiments Described

In 1951 extensive experiments were carried out in three widely separated black raspberry plantings near Cincinnati and at Wooster. Sections of each planting were left unsprayed. Other sections were given only the customary early spray of lime-sulfur. In other sections, the lime-sulfur spray was followed with applications of various fungicides just before blooms opened, and again two weeks later.

"In the unsprayed plots and even in the plots receiving the lime-sulfur spray alone, many laterals and some canes were so badly diseased that they were judged to be totally incapable of producing any fruit the following year," Dr. Winter reports.

But where the "prebloom and postbloom" sprays of a chemical compound known as "ferbam" were added evidence of the disease was negligible. Ferbam is one of a series of organic chemicals developed through the Du Pont Company's agricultural research program as a protectant against plant diseases. It is

more commonly known to growers as "Fermate" fungicide. Following are experimental results reported:

Sprays Applied	Anthracnose Spots Per Cane, Mid-July
Liquid lime-sulfur at bud-break only	24.6
Liquid lime-sulfur plus ferbam at prebloom only	7.4
Liquid lime-sulfur plus ferbam at both prebloom and postbloom	1.6
No sprays applied	79.3

Recommendations for Spraying

"Those plants showing an average of only two or three spots per cane should not suffer any perceptible yield reduction due to anthracnose," Dr. Winter declares.

For either commercial growers or home owners with a backyard berry patch who wish to protect their bushes from anthracnose, the following spray recommendations were made by the Ohio Agricultural Experiment Station:

(1) Liquid lime-sulfur, eight gallons in water to make 100 gallons of spray, applied when buds show a half-inch of green in the spring.

(2) Ferbam, two pounds per 100 gallons of water, just prior to blooming.

(3) Ferbam, two pounds per 100 gallons of water, two weeks later.

VERSATILE PLASTIC USED IN COATING PAPER DRUMS FOR VARIETY OF USES

ATLANTIC CITY, N. J. -- Fertilizers for agriculture, chemicals for industry, foods and medicines for the home are some of the things that can be packaged in materials coated with Du Pont's "Alathon" polythene resin, shown at the 21st National Packaging Exposition here recently.

Drums made of paper coated with "Alathon" for the shipment of materials which could not be transported satisfactorily in metal containers because of corrosion, moisture absorption, and other difficulties were shown.

The drums, available in capacities ranging from 12 to 75 gallons, are made in multiple spiral-wise windings of paper coated with "Alathon" polythene resin. Such paper, technical men said, has provided packaging for peat moss and humus that will withstand bacterial attack which has been a problem with other containers.

DU PONT COLLECTED NEARLY SIXTY THOUSAND TONS OF SCRAP IN YEAR

The Du Pont Company "mined" enough iron and steel scrap in 1951 to make the steel for a 45,000-ton battleship, a naval aircraft carrier, 2,000 Sherman tanks, and 440,000 five-inch shells.

The scrap was rounded up by the company's salvage and reclamation program, begun in 1907 and pressed with redoubled intensity in response to the National Production Authority's plea for scrap metals needed for defense and essential civilian production. Du Pont's collection was channeled to outside companies and into re-use in its own operations.

From Du Pont plants and installations the drive in 1951 netted 132,371,000 pounds or more than 59,000 gross tons of all scrap metals, including iron, steel, iron-bearing sludge, lead, copper, aluminum, nickel, and zinc.

Iron and steel scrap totaled 56,250 gross tons, sufficient to provide the scrap content to forge, with hot melt steel from ore, all the steel for either three 45,000-ton battleships of the Iowa class, or four carriers of the Essex type, or 4,400 Sherman type tanks, or 2,835,000 five-inch shells.

NEW DU PONT TIME STUDY SHOWS HOW PREPACKAGED PRODUCE BUILDS SALES

Although the average shopper spends 24 per cent less time in a self-service produce department than in a service one, she actually buys 16 per cent more fruits and vegetables, according to a Du Pont consumer survey.

The survey, "Prepackaging -- An Approach to Produce Profits," was released by the Du Pont Film Department at the annual Super-Market Institute Convention, held recently in Cleveland.

Five thousand shoppers, the survey pointed out, spent 221.1 hours purchasing 11,859 items in service produce departments. A similar number of shoppers spent only 167.4 hours in self-service produce departments -- and bought 2,235 more items!

Why Fruit and Vegetable Sales Lagged

The survey also pointed out that prepackaged produce is the answer to the problem of building impulse, or unplanned, sales. Quoting a recent Du Pont study, the survey said the impulse rating for fresh fruits and vegetables was only 32.4 per cent. This contrasted with a 38.4 per cent average rating for all foods.

Reason for the low rating for fresh produce, the survey reported, were typical service department delays -- waiting in line to be served, or for the items to be weighed or wrapped.

Prepackaged Meats Also Increase Sales

Another Du Pont consumer survey, also released at Cleveland, showed that self-service meat shoppers purchased more products in about one half the time it took a similar number of shoppers to complete their purchases in service meat departments.

The survey, "Time Lost or Time Saved," was made during a normal shopping week in stores throughout the country. It disclosed that 2,700 shoppers in self-service meat departments purchased 5,927 items in 116.7 hours, while an equal number of service meat shoppers spent 198 hours making 5,467 purchases.

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